Assignment 1

Deadline for submission: 30th March 2021

1. What observations did Charles Darwin make during his voyage across Galapagos islands?

2. What does our microbiome do?

3. (i) Referring to the genetic code (the codon usage table), what would be the amino acid sequence of the polypeptide encoded by the following mRNA sequence?
   5' AUGGUGGCCUAUCAUUAGGGGCUU 3'
   (ii) What would be the effect on translation of the above sequence of a single base (point) mutation which gave rise to an A instead of a U at the twelfth base?
   (iii) What would be the effect on translation of the sequence in (i) above, if an extra C were inserted between the third and fourth bases, i.e., between the two Gs at position 3 and 4?

4. Find out if BamHI is a good restriction endonuclease for cutting the SARS-COV-2 genome? Give reasons.

5. Your cloning vector has restriction recognition sites for two restriction endonucleases, EcorI and BamHI. However, the DNA to be manipulated does not have recognition sites for these two restriction endonucleases. How would you construct a recombinant DNA for the given DNA?

6. The enzymes BamH I and Bal II recognise different sequences but leave the same sticky ends:
   BamH I: ----------G|G A T C C ------

   Bal II: ----------A|G A T C T ------
   (i)Will the two enzymes result in the same number of fragments in a random DNA sequence? Give reasons.
   (ii)What's the advantage of having such a pair of REs? Explain with example.

7. Both cloning and PCR can be used for making copies of DNA. What is the advantage or limitation of one over the other?